Claims:

We claim:

1. A vector comprising an exogenous gene which encodes a protein which has the same functional activity as a protein encoded by the *Arabidopsis thaliana MinE* or *MinD* gene and which when expressed in a plant cell causes the plant cell to have enlarged and/or a reduced number of chloroplasts.

2. A cell comprising the vector of Claim 1.

3. A tissue culture comprising cells of Claim 2.

4. A seed comprising the vector of Claim 1.

5. The vector according to Claim 1, wherein said exogenous gene is derived from *Arabidopsis thaliana*.

6. The vector according to Claim 1, wherein the exogenous gene is an exogenous *MinD* gene.

7. The vector according to Claim 6, wherein said exogenous *MinD* gene is derived from *Arabidopsis thaliana MinD* gene.

8. The vector according to Claim 1, wherein the exogenous gene is an exogenous *MinE* gene.

9. The vector according to Claim 8, wherein said exogenous *MinE* gene is derived from *Arabidopsis thaliana MinE* gene.

10. A transgenic plant comprising within its nuclear genome an exogenous gene, wherein said exogenous gene encodes a protein which has the same functional activity as a protein encoded by the *Arabidopsis thaliana MinE* or *MinD* gene and which when expressed in a plant cell causes the plant cell to have enlarged and/or a reduced number of chloroplasts.

11. The transgenic plant according to claim 10, wherein said exogenous gene is derived from *Arabidopsis thaliana.*

12. The transgenic plant according to Claim 10, wherein said exogenous gene is an exogenous *MinD* gene.

13. The transgenic plant according to Claim 12, wherein said exogenous *MinD* gene is derived from *Arabidopsis thaliana MinD* gene.

14. The transgenic plant according to Claim 10, wherein said transgenic plant is a tobacco plant.

15. The transgenic plant according to Claim 10, wherein said exogenous gene is an exogenous *MinE* gene.

16. The transgenic plant according to Claim 15, wherein said exogenous *MinE* gene is derived from *Arabidopsis thaliana MinE* gene.

17. A method of transforming the chloroplast genome of a plant, said method comprising the steps of:

A) producing a nuclear transgenic plants which contains large chloroplasts by:

i) providing a vector comprising an exogenous gene which encodes a protein which has the same functional activity as a protein encoded by the *Arabidopsis thaliana MinE* or *MinD* gene and which when expressed in a plant cell causes the plant cell to have enlarged and/or a reduced number of chloroplasts; and,

ii) transforming the nuclear genome of a plant with said vector which comprises said exogenous gene; and,

B) transforming the chloroplast genome of said nuclear transgenic plant with a vector which comprises Gene of interest.

18. The method of Claim 17, wherein said exogenous gene is derived from *Arabidopsis thaliana*.

19. The method of Claim 17, wherein said exogenous gene is an exogenous *MinD* gene.

20. The method of Claim 19, wherein said exogenous *MinD* gene is derived from *Arabidopsis thaliana MinD* gene.

21. The method of Claim 17, wherein said nuclear transgenic plant is a tobacco plant.

22. A chloroplast transgenic plant produced by the method of Claim 17.

23. The method of Claim 17, wherein said exogenous gene is an exogenous *MinE* gene.

24. The method of Claim 23, wherein said exogenous *MinE* gene is derived from *Arabidopsis thaliana MinE* gene.

25. A method of selecting for plants that are chloroplast transgenics but not nuclear transgenics, wherein said method comprises:

A) crossing a plant produced by the method of Claim 22 with a wild-type plant; and,

B) segregating out the plants which express the exogenous gene or genes of interest in the chloroplast genome and further do not express the exogenous gene in the nuclear genome by identifying which plants have normal chloroplast size and number and have the desired characteristic produced by the exogenous gene expressed in the chloroplast genome.

26. The method of Claim 25, wherein said exogenous gene is derived from *Arabidopsis thaliana*.

27. The method of Claim 25, wherein said plant which is a chloroplast transgenic is a tobacco plant.

28. A method of producing a transgenic plant which comprises one or a few large chloroplasts, said method comprising the steps of:

A) producing a vector comprising an exogenous gene which encodes a protein which has the same functional activity as a protein encoded by the *Arabidopsis thaliana MinE* or *MinD* gene and which effects a plant cell by allowing for the expression of only one or a few large chloroplasts; and

B) transforming the nuclear genome of a plant with said vector.

29. The vector according to Claim 28, wherein said exogenous gene is derived from *Arabidopsis thaliana*.

30. The vector according to Claim 28, wherein the exogenous gene is an exogenous *MinD* gene.

31. The vector according to Claim 30, wherein said exogenous *MinD* gene is derived from *Arabidopsis thaliana MinD* gene.

32. The vector according to Claim 28, wherein the exogenous gene is an exogenous *MinE* gene.

33. The vector according to Claim 32, wherein said exogenous *MinE* gene is derived from *Arabidopsis thaliana MinE* gene.